

CLAIMS

I claim:

- 1 1. A wearable directional antenna, comprising:
  - 2 a) a clothing comprising a non-conductive material;
  - 3 b) a plurality of EM energy reflectors, operatively coupled to said clothing, capable of
  - 4 reflecting EM energy;
  - 5 c) a plurality of antenna elements, operatively coupled to said plurality of EM energy
  - 6 reflectors, capable of receiving and transmitting EM energy in a specified direction
  - 7 wherein said plurality of EM energy reflectors do not short said plurality of antenna
  - 8 elements.
- 1 2. The wearable directional antenna of Claim 1, wherein said clothing comprises a vest.
- 1 3. The wearable directional antenna of Claim 1, wherein said plurality of EM energy reflectors
- 2 comprises conductive metal tubules that are substantially evenly distributed in dielectric
- 3 material.
- 1 4. The wearable directional antenna of Claim 1, wherein said plurality of EM energy reflectors
- 2 comprises tubular composite material.
- 1 5. The wearable directional antenna of Claim 1, wherein said plurality of antenna elements is
- 2 operatively coupled to said clothing and said plurality of EM energy reflectors.
- 1 6. The wearable directional antenna of Claim 1, wherein antenna radiation patterns of said
- 2 plurality of antenna elements have nulls at a head and lower torso of a user.
- 1 7. The wearable directional antenna of Claim 1, wherein said plurality of antenna elements
- 2 comprises conductive cloth.
- 1 8. The wearable directional antenna of Claim 1, wherein said plurality of antenna elements
- 2 comprises conductive cloth coated in waterproof material.
- 1 9. The wearable directional antenna of Claim 1, wherein said plurality of antenna elements
- 2 comprises a conductive, washable, wearable cloth.

- 1 10. The wearable directional antenna of Claim 1, wherein said plurality of antenna elements  
2 receive and transmit EM energy in said specified direction by selectively outputting weighted  
3 signals to selected antenna elements.
- 1 11. The wearable directional antenna of Claim 1, wherein each antenna element of said plurality  
2 of antenna elements has a length approximately equal to a half wavelength of a desired  
3 frequency.
- 1 12. The wearable directional antenna of Claim 1, wherein each antenna element of said plurality  
2 of antenna elements comprises a half wave dipole antenna.
- 1 13. The wearable directional antenna of Claim 1, wherein each antenna element of said plurality  
2 of antenna elements comprises a pair of conductive strips.
- 1 14. The wearable directional antenna of Claim 1, further comprising a weighting device,  
2 operatively coupled to said plurality of antenna elements, capable of receiving transmission  
3 signals and outputting weighted signals to said plurality of antenna elements.
- 1 15. The wearable directional antenna of Claim 14, wherein said weighting device further  
2 comprises:
- 3 i) a power sensing device, operatively coupled to said plurality of antenna elements,  
4 capable of receiving reception signals from said plurality of antenna elements and  
5 determining relative strengths of received power from each antenna element of said  
6 plurality of antenna elements, and capable of outputting data regarding relative  
7 strengths of received power from each antenna element;
- 8 ii) a power distributor, operatively coupled to a communication device, capable of  
9 receiving transmission signals from said communication device and outputting  
10 weighted transmission signals;
- 11 iii) a power controller, operatively coupled to said power sensing device and said power  
12 distributor, capable of receiving data from said power sensing device and weighted  
13 transmission signals from said power distributor, and capable of outputting weighted  
14 transmission signals to selected antenna elements of said plurality of antenna  
15 elements based on data from said power sensing device.

1 16. The wearable directional antenna of Claim 15, wherein said power distributor comprises:

2 (1) a first splitter, operatively coupled to said communication device, capable of  
3 receiving transmission signals from said communication device and outputting  
4 half power transmission signals;

5 (2) a second splitter, operatively coupled to said first splitter, capable of receiving  
6 half power transmission signals from said first splitter and outputting quarter  
7 power transmission signals;

8 (3) a first switch, operatively coupled to said second splitter and said plurality of  
9 antenna elements, capable of receiving quarter power transmission signals and  
10 outputting quarter power transmission signals to selected antenna elements of said  
11 plurality of antenna elements;

12 (4) a second switch, operatively coupled to said second splitter and said plurality of  
13 antenna elements, capable of receiving quarter power transmission signals and  
14 outputting quarter power transmission signals to selected antenna elements of said  
15 plurality of antenna elements;

16 (5) a third switch, operatively coupled to said first splitter and said plurality of  
17 antenna elements, capable of receiving half power transmission signals and  
18 outputting half power transmission signals to selected antenna elements of said  
19 plurality of antenna elements.

1 17. The wearable directional antenna of Claim 15, wherein said first switch, said second switch  
2 and said third switch comprise MEMS switches.

1 18. The wearable directional antenna of Claim 15, wherein said power controller comprises a  
2 plurality of single-pole, multi-throw switches having a parallel configuration, wherein said  
3 plurality of single-pole, multi-throw switches is capable of outputting weighted transmission  
4 signals to said plurality of antenna elements.

1 19. The wearable directional antenna of Claim 15, wherein said power controller comprises a  
2 plurality of single-pole, four-throw switches having a parallel configuration, wherein said  
3 plurality of single-pole, four-throw switches is capable of outputting weighted transmission  
4 signals to said plurality of antenna elements.

- 1 20. The wearable directional antenna of Claim 15, wherein said power controller comprises a  
2 switch matrix.
- 1 21. The wearable directional antenna of Claim 14, further comprising an I/O device, operatively  
2 coupled to said plurality of antenna elements and said weighting device.
- 1 22. A method for a wearable directional antenna, the method comprising the steps of:
- 2 a) measuring received power of said plurality of antenna elements;
- 3 b) determining which antenna element of said plurality of antenna elements has a highest  
4 received power;
- 5 c) selecting a highest received power antenna element for directing energy to and from;
- 6 d) returning to said measuring step (a).
- 1 23. A wearable directional antenna, comprising:
- 2 a) means for measuring received power of said plurality of antenna elements;
- 3 b) means, operatively coupled and response to said means for measuring received power, for  
4 determining which antenna element of said plurality of antenna elements has a highest  
5 received power;
- 6 c) means, operatively coupled and response to said means for determining which antenna  
7 element of said plurality of antenna elements has a highest received power, for selecting a  
8 highest received power antenna element for directing energy to and from.